

milling, and both 'incising' and 'milling' are cutting. Accordingly, the channel shown in Figs. 18 and 18A are milled or incised.

Amendments to the Specification:

The priority/related application information has been added to the specification as requested in the Office Action, and the typographical errors in the claims have been corrected as well.

Rejections under 35 U.S.C. 112, Second Paragraph:

The rejection of claims 10-14 and 35-37 hereunder is not completely understood and clarification is requested if the rejection is maintained.

The rejection alleges that these claims are unclear because while they purport to claim a sealing segment or sealing ring, the body in each claim "positively recites" the turbine or portions thereof.

The Examiner is correct that Applicants are claiming the segment or ring as a subcombination because that is what is recited in the preamble of these claims. The turbine, or portions thereof, are recited in the claims to particularly point out and distinctly claim to those of ordinary skill in the art how the claimed segment or ring cooperates with the turbine, the environment in which the claimed seal is designed to be used. What is being claimed is a seal that is retractable, and to be retractable it must have the recited structure *and* be located in a turbine having certain structural features because, sitting on a table, the seal will not retract from anything. Claim 10 has been amended to more simply and clearly claim the invention; the deleted sections were redundant of later recitations.

Should the rejection be maintained, it is requested that the rejection specify why the language used in the claim is not conventional and would not be understood by one of ordinary skill in this art. *In re Kamal*, 158 U.S.P.Q. 320 (C.C.P.A. 1968); *In re Borkowski*, 164 U.S.P.Q. 642 (C.C.P.A. 1970); *Orthokinetics Inc. v. Safty Travel Chairs, Inc.*, 1 U.S.P.Q.2d 1081 (Fed. Cir. 1986).

Applicants would note that the language of claims 10 and 35 is quite similar to that recited in the claims of an earlier Brandon patent, U.S. Pat. No. 4,436,311, directed to a retractable seal, and claim as a seal "in an elastic fluid turbine."

Claim 14 has been amended to change its dependency, thereby providing antecedent basis for "said channel."

Rejections under 35 U.S.C. 103

All of the claims stand rejected hereunder as obvious over the combination of Brandon and Hemsley, and optionally further in combination with Veau, Bagepalli, Dalton, and/or Sanders. These rejections are respectfully traversed.

The thrust of the rejection is that the combination of Brandon and Hemsley renders obvious a retractable packing having a brush seal. In traversal of this rejection, Applicants herewith present the Declaration of Richard Shifler under 37 C.F.R. § 1.132.

In substantive part, Mr. Shifler asserts in his declaration that in his experience of almost 50 years in the steam turbine industry (§ 3), prior to the Addis application he was not aware of any prior art device or publication that disclosed or incorporated a brush seal element as a part of the seal member of a retractable seal (§ 16). The cited Hemsley patent, which is a non-retractable seal (§ 17), includes a spring that is biases the seal *towards* the shaft, which is directly contrary to the bias direction taught in the Brandon patent (§ 18).

As Mr. Shifler explains, the Hemsley arrangement keeps the seal against the shaft, and while the seal may have some give away from the shaft during a transient, the disclosed arrangement whereby the seal is always at a small clearance position will not prevent damage to the seal (§§ 19-21). In fact, the Hemsley arrangement requires the brush to be constantly rubbing against the shaft, thereby causing excessive wear and likely differential heating of the shaft, which causes that portion to bow outwardly, exacerbating the likelihood of damage to the seal from the shaft (§22).

The combination of a brush seal with a retractable packing is not as straightforward as assumed in the rejection. Mr. Shifler explains that there is a complex interaction of forces necessary to both open and close a conventional retractable packing, and adding a brush seal

further complicates the matter (§§ 24-28). For example, not all steam pressure forces act to close the seal: while the pressure drop over the high pressure end does tend to close the seal, the pressure drops at the low pressure end actually tend to open the seal (§§ 29-30). Further, if the brush is in contact with the shaft, it will wear over time, further changing the force distribution, and this must be taken into account (§ 31).

Thus, one can readily add a brush to the packing described in the Hemsley patent and expect it to work, but such is not so readily apparent when a brush is added to the retractable seal described by Brandon (§ 32).

Accordingly, the allegation that it would have been obvious to combine “the brushes as taught by Hemsley with the invention of Brandon so that bending of the bristles absorb transient deviation of the shaft from its normal running position to nullify any effects of wear on the shaft and prevent local heating leading to axial stresses which could bend the shaft” is not well taken in light of Mr. Shifler’s declaration. It is not “the bending of the bristles” that absorbs the transients, but the fact that the seal is at a larger clearance that prevents both the bristles and the other elements of the seal (such as the teeth) from damage due to the transients. Further, the bending of the bristles still does not alleviate the problem of localized heating presumed in the rejection because Hemsley specifically teaches that the bristles are always in contact with the shaft, and so there is always localized heating.

The addition of Veau or Bagepalli does not add anything to the rejection. As Mr. Shifler notes, Veau is directed to a conventional brush seal (§ 33). The alleged obviousness of the construction of a portion of the claimed invention, namely the brush portion, does not render obvious the whole of the claimed invention, namely a retractable seal having a brush portion.

The addition of Dalton is not believed to be warranted if the issue is the conventional structure of the turbine, because Applicant is not claiming changes to that structure, but rather an improvement on a seal that can be used in a conventional turbine.

Claims 6 and 22 have been cancelled, so the combination with Sanders is moot.

In summary, the combination of Brandon and Hemsley, which teach away from each other at least because of their respective spring biases, fails to render obvious the claimed

invention. Further, the need to include one or two *additional* patents to this combination to make out a supposed *prima facie* case of obviousness actually shows the unobviousness of the claimed invention.

Conclusion

In light of the foregoing, withdrawal of the rejections, and further and favorable action, in the form of a Notice of Allowance, are believed to be in order, and such actions are earnestly solicited.

Petition for Extension of Time

Pursuant to the provisions of 37 CFR 1.136(a), Applicants hereby petition for a three month extension of time to 6 December 2000 in order to respond to the Office Action dated 6 June 2000. Please debit the extension fee amount of \$ 890.00 and any other fees under 37 C.F.R. § 1.16 or § 1.17 necessitated by this paper from the firm's Deposit Account No. 08-2776.

Respectfully submitted,



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CERTIFICATE OF MAILING OR TRANSMISSION – 37 CFR 1.8

I hereby certify that I have a reasonable basis that this paper, along with any referred to above, (i) are being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to Commissioner of Patents and Trademarks, Washington, D.C. 20231, or (ii) are being transmitted to the U.S. Patent & Trademark Office in accordance with 37 CFR § 1.6(d).

DATE: 6 Dec. 2000

NAME: Heather A. McLennand

SIGNATURE: Heather A. McLennand

Dated: 6 December 2000